

UPSCALING PAINTED RELEASE FILMS FOR THE SUSTAINABLE PRODUCTION OF TOMORROW

Group Members: Tirtha Prasad Amonkar, Ahmed Faraz, Aravind Arunkumar, Jacquelin Abraham, Sathiyavarshan Kuppusamy, Joseph Sanki
Supervisor: Manuel Löwe

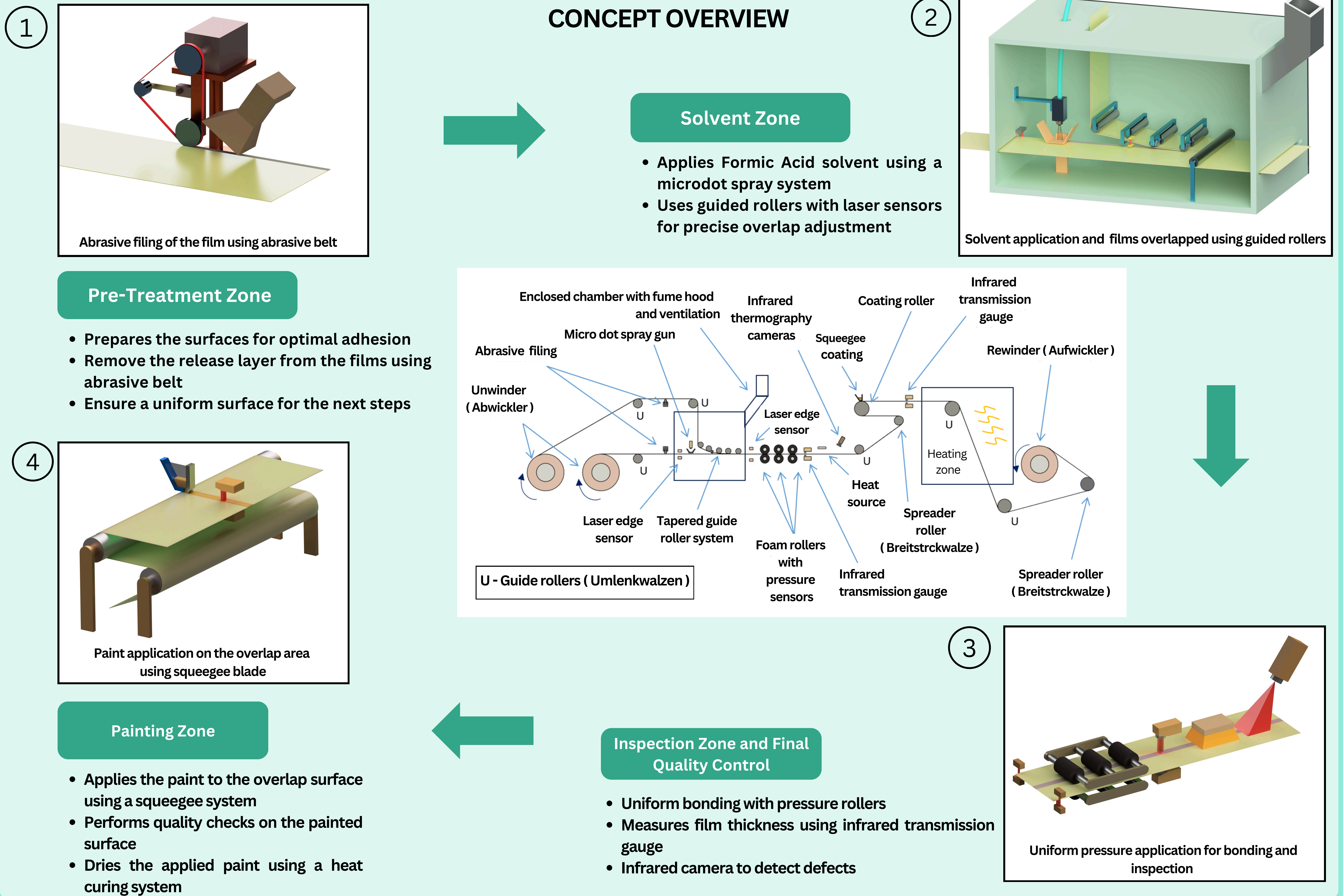
AIM

- Achieve an airtight combination of multiple release films
- Maintain the film thickness after joining
- Ensure a smooth joint seam for uniform surface quality
- Fill gaps in the paint layer to prevent imperfections
- Measure and control film layer thickness for precision manufacturing

METHODOLOGY

- Solution Identification – Selected solvent bonding
- Solvent selection & Testing – Chose Formic Acid
- Validation through lab-scale testing
- Process Automation Development
- Automated System Design & Visualization (2D & 3D)

CONCEPT OVERVIEW



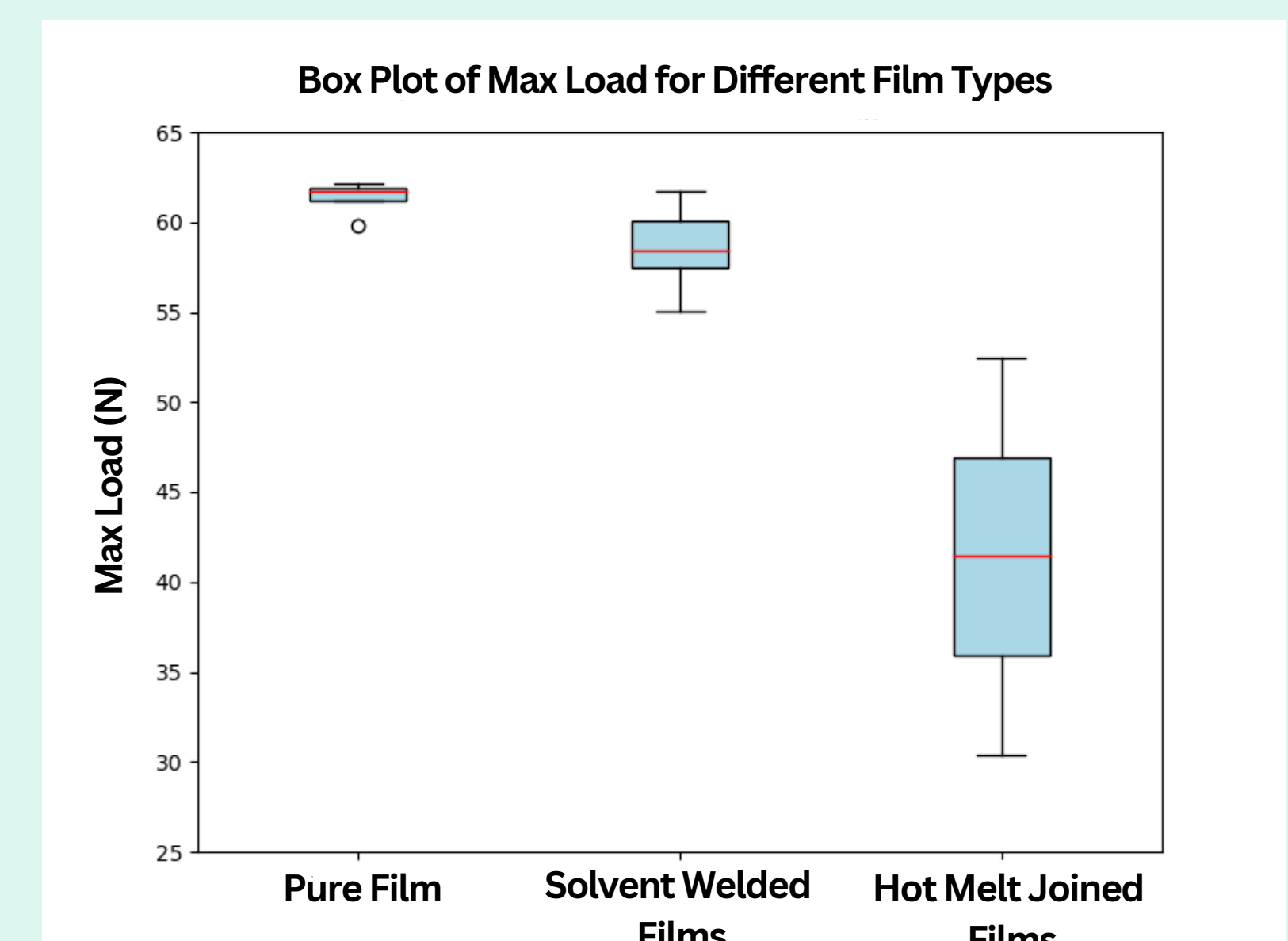
TESTING

Design of Experiments

No.	Width (mm)	Overlap (mm)	Drops (0.04 ml)	Application	Tapering	Repetition
1.	30	5	1	Pipette	Dremel*	3
2.	30	5	2	Pipette	Dremel*	3
3.	30	10	2	Pipette	Dremel*	3
4.	30	10	3	Pipette	Dremel*	3
5.	30	10	3	Pipette	None	3

*Dremel-Multi tool-abrasive sanding paper

Results



CONCLUSION

- Successfully developed a scalable solvent bonding process for release films
- Validated through tensile tests, confirming stronger bond strength with Formic Acid.
- Completed process visualization, providing a clear roadmap for automation

Group Members	Task areas	Devoted Time in hours
Tirtha Prasad Amonkar	Product owner, Concept flowchart	98
Ahmed Faraz	Product owner, Testing	97
Aravind Arunkumar	Scrum master	95
Jacquelin Abraham	Literature review, Concept flowchart	95
Sathiyavarshan Kuppusamy	Concept visualization	97
Joseph Sanki	Literature review, Poster design	95